

CLAIMS

1. A process for controlling welding of an element to a component by a welder, the process comprising:

- (a) determining an energizing height;
- (b) lifting the element to a height;
- (d) detecting the height as the element is lifted;
- (e) energizing the welder at the energizing height to create a welding arc;
- (f) welding the element to the component for a specified time;
- (g) lowering the element in relation to the component;
- (h) detecting the height as the element and component are welded together;

and

- (i) turning off the energy to the welder.

2. The process of Claim 1, wherein the element is a metal stud and the component is a metal sheet.

3. The process of Claim 2, wherein the metal stud and the metal sheet are parts of a motor vehicle.

4. The process of Claim 1, wherein speed of lowering is constant regardless of the speed of lifting.

5. The process of Claim 1, wherein the specified time is controlled by the lowering speed.

6. The process of Claim 1, wherein the energizing height is maintained until the initiation of the lowering the elements.

7. The process of Claim 1, wherein speed of the lowering is controlled as a factor of speed of the lifting.

8. A process for welding an element to a component using a feed unit and a welding head, the process comprising:

- (a) feeding the element from the feed unit to the welding head;
- (b) moving the element along a substantially linear path from the component to a first location;
- (c) detecting a distance that the element was moved;
- (d) energizing the welding head;
- (e) welding the element to the component for a specified time;
- (f) retracting the element relative to the component; and
- (g) stopping energy to the welding head at an end of the specified time.

9. The process of Claim 8, wherein the component is a body panel.

10. The process of Claim 9, wherein thickness of the body panel is about 0.5 mm.

11. The process of Claim 9, wherein the body panel is part of a motor vehicle.

12. The process of Claim 8, further comprising continually detecting the distance during the entire specified time.

13. The process of Claim 12, further comprising initiating retracting while holding the arc welding at a constant electrical voltage is based on the detected distance.

14. The process of Claim 8, wherein the element is a metal stud.

15. The process of Claim 8, wherein the component is a metal sheet.

16. The process of Claim 8, further comprising controlling the speed of the retracting as a factor of speed of the moving.

17. The process of Claim 8, further comprising controlling of the specified time by the retracting speed.

18. The process of Claim 8, further comprising maintaining the distance until the initiation of the retracting.

19. A process for welding an element to a component using a feed unit and a welding head, the process comprising:

- (a) feeding the element from the feed unit to the welding head;
- (b) lifting the element along a substantially linear path in relation to the component;
- (c) detecting a height that the element was lifted;
- (d) energizing the welding head;
- (e) welding the element to the component for a specified welding energy;
- (f) lowering the element in relation to the component; and
- (f) stopping energy to the welding head upon completion of the specified welding energy.

20. The process of Claim 19, wherein the component is a body panel for a motor vehicle.

21. The process of Claim 20, wherein thickness of the body panel is about 0.5 mm.

22. The process of Claim 19, further comprising continually detecting the height during the entire specified welding energy.

23. The process of Claim 22, further comprising initiating the lowering while holding the arc welding at a constant electrical voltage based on the detected height.

24. The process of Claim 19, wherein the element is a metal stud.

25. The process of Claim 19, wherein the component is a metal sheet.

26. The process of Claim 19, further comprising controlling speed of the lowering as a factor of speed of the lifting.

27. The process of Claim 19, further comprising controlling of the specified welding energy by the lowering speed.

28. The process of Claim 19, further comprising maintaining the height until the initiation of the lowering.

29. A welding system for welding an element to a component, the system comprising:

(a) a welding head operably initially moving the element in relation to the component and later returning the element;

(b) a detector operably detecting movement of the element;

(c) a power supply operably providing power for forming the arc between the component and the raised element; and

(d) a controller operably controlling the welding head to move and return the element as a factor of the detected movement.

30. The system of Claim 29, further comprising an electric motor operably lifting and lowering the element.

31. The system of Claim 30, wherein the motor is a linear motor.

32. The system of claim 29, wherein the element is a metal stud and the component is a metal sheet.

33. The system of claim 32, wherein the metal stud and the metal sheet are parts of a motor vehicle.

34. The system of Claim 29, wherein the system includes multiple welding heads.

35. The system of Claim 29, wherein the element is arc welded to the component by the welding head.